COMMONWEALTH OF PENNSYLVANIA.

DEPARTMENT OF AGRICULTURE.

BULLETIN NO. 122.

Analyses of

Concentrated Commercial Feeding Stuffs

BY

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FROM

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PREFACE.

The following Bulletin No. 122 needs no introduction. The benefit to be derived by farmers and other feeders as well as to dealers from having at hand for reference such a report of the value of feeding stuffs found upon the market has been demonstrated by the reports that have preceded. It is impossible to secure samples of all the Concentrated Commercial Feeding Stuffs sold within the State, but enough have been secured to admonish manufacturers who may be disposed to resort to adulteration to enable them to secure larger profits, that such methods are liable to be discovered and are therefore unsafe.

N. B. CRITCHFIELD,
Secretary of Agriculture.

ANALYSIS OF CATTLE FOODS.

There have been received during the year 1903, from Mr. Enos B. Engle, the official sampling agent of the Department, 242 samples of cattle-foods for examination.

These samples fall under the following classes, according to the brand names under which they were sold:

Cotton-seed Products:		
Cotton-seed meal,	6	
Cotton-seed feed,	1	
		7
Linseed meals,		10
Buckwheat middlings,		1
Wheat Products:		
Bran,	4	
Middlings,	9	
Wheat feed,	3	
		16
Rye Products:		
Rye chop,	4	
Rye feed,	1	
Rye gluten meal,	1	
		6
Barley Products:		
Barley chop,	1	
Barley feed,	1	
Malt sprouts,	1	
		3
Oat feeds,		8
Corn Products:		
Simple milling products,	12	
Corn bran,	2	
Gluten feeds,	3	
Hominy feed,	1	
Hominy meal,	1	
Other products,	2	
		21

Mixed Feeds of Named Components:		
Corn and oats chops and feeds,	48	
Corn, oats and barley chops,	3	
Rye and oats chops,	4	
Corn, rye and oats chops,	5	
		60
Chops and Feeds whose Components are not Named:		
Proprietary:		
Non-condimental,	17	
Condimental,	2	
General,	91	
		110
		242

The following data indicate the representative character of these samples:

Number of manufacturers and jobbers represented,	146
Number of manufacturers and jobbers from other states,	32
Number of brands represented,	236
Number of places at which samples were selected,	118
Number of dealers from whom samples were taken,	129

The manner of sampling, preservation and preparation for analysis corresponds to the description given in Bulletin 107. Many of the samples received during the winter months showed an excessive moisture content; several showed distinct evidence of mustiness, and were, therefore, rejected as not fairly representative. Where such mustiness appears the crude fat or ether extract of corn products especially, shows a distinct decrease. Moisture was determined in all cases, but in this report, for the sake of compactness, samples having more than 12 per cent. of moisture when received, are marked with a dagger (†) set opposite the sample number. Determinations of protein and fat were made in duplicate in all cases, using the methods of the Association of Official Agricultural Chemists. The details of the protein determination were carried out chiefly by H. L. Wilson, B. S., and R. E. Stallings, M. S.; those of fat by W. M. Darrow, B. S., and M. S. Pingree, B. S., assistant chemists. The assistant last named was charged with the care and preparation of samples and records.

In addition to the chemical analysis, a microscopic examination was made of each sample, as the best means of determining the specific nature of mixed feeds and the freedom of the various samples from adulterants. These examinations were made by R. O. Brooks, B. S., special assistant in food chemistry. The general methods of such examination were briefly stated in Bulletin 107. The difficulty of the exact distinction between wheat, rye and barley in mixtures was there stated. In the examinations made this year, in addition to careful measurements of the starch grains, other methods of distinction were employed. Thus rye starch grains when heated in contact with water to a temperature of 62.5 degrees C., almost all of them break up into small fragments and form a clyster or paste, while wheat and barley starches are little affected, if the temperature is not allowed to rise beyond this point. Again, the hairs growing at the tips of the oats, barley, rye and wheat grains present quite well marked differences, the most conspicuous of which is in the thickness of their walls and the relative width of the narrow empty tube formed by these walls, the walls of the oat and wheat hairs being thick and the tubes relatively narrow in internal diameter, while the reverse is true of barley and rye hairs. Again, the tissues of the brans of wheat, rye and barley exhibit differences which are useful in distinguishing the grains. There are, however, many feeds in which the hairs and bran are present in very minute quantity only, or come from only part of the grains whose products enter the mixture. All of these tests have been used in every case in doubt.

The results of the examination of the 1903 samples are tabulated in the following tables. Samples are grouped in accordance with the indication of the brand name; where the latter is not significant, in the case of products derived from a single grain, the report is grouped with those for products named as derived from that grain. The tables are as follows:

I. Cotton-seed products.
II. Linseed meals.
III. Buckwheat products.
IV. Wheat products.
V. Rye products.
VI. Barley products.
VII. Oat products.
VIII. Corn products.
IX. Mixed feeds whose ingredients are named in the brand.
X. Mixed feeds whose ingredients are not named in the brand.
    [I.] Proprietary brands.
    [II.] Brands not proprietary.

The data in the tables are arranged in alphabetical order by manufacturers. Points of special interest respecting any group are discussed in pages following the tables.

In comparing percentages found with those guaranteed, it is fair to consider that the satisfactory sampling of feeding-stuffs is not easily accomplished, especially when coarse, light materials such as bran and oat hulls are mixed with heavier meals and middlings, since the lighter and heavier materials tend to separate during transportation. Furthermore, in determining protein, an indirect method is employed, nitrogen being the constituent actually determined, and the protein estimated by multiplication of the nitrogen percentage by the factor 6.25. Variations of .10 to .15 per cent. of nitrogen are not uncommon between duplicate analyses upon the same, well prepared feeding-stuff; these would correspond to variations of .62 to .94 per cent. of protein.

ANALYSES

OF

FEED STUFFS

1903.

TABLE I—COTTON SEED PRODUCTS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
	I. COTTON SEED MEAL.			
2	The American Cotton Oil Co., Pinckney, Ark.,	Prime Cotton-seed Meal,	Downingtown,	Wells & Walker.
116	F. M. Brode & Co., Memphis, Tenn.,	Cotton-seed Pure Meal,	Elizabethtown,	A. W. Martin.
211	Humphreys, Goodwin & Co., Memphis, Tenn.,	Dixie Cotton-seed Meal,	Foster Station,	M. Meritheu.
124	*H. K. Keller, Lancaster, Pa.,	Cotton-seed Meal,	Lancaster,	Frederick Pontz.
208	Hugh Pettit & Co., Memphis, Tenn.,	Horse Shoe Brand, Cotton-seed Meal,	New Milford,	H. B. Carpenter & Co.
230	Shamokin Milling Co., Shamokin, Pa.,	Green Diamond Prince, Cotton-seed Meal,	Northumberland,	Northumberland Milling Co.
	II. COTTON SEED FEED.			
11	Southern Cotton Oil Co., Camden, N. J.,	Cotton-seed Feed,	Gleason,	J. Givler.

*Agent, shipper or jobber.

TABLE I—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent	Per cent.	Per cent.	
	I. COTTON SEED MEAL.					
2	The American Cotton Oil Co., Pinckney, Ark.,	43.	42.19	9.	12.06	
116	F. M. Brode & Co., Memphis, Tenn.,	43.	38.97	9.	12.15	
211	Humphreys, Goodwin & Co., Memphis, Tenn.,	43.	40.87	9.	9.01	
124	*H. K. Keller, Lancaster, Pa.,	....	40.94	....	9.22	
208	Hugh Pettit & Co., Memphis, Tenn.,	43.	42.41	9.	8.30	
230	Shamokin Milling Co., Shamokin, Pa.,	43.	42.75	9.	8.30	
	II. COTTON SEED FEED.					
11	Southern Cotton Oil Co., Camden, N. J.,	10.	5.96	3.	2.12	

TABLE II—LINSEED MEALS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
42	American Linseed Co.. Chicago, Ill.,	Cleveland Coarse Linseed Meal,	Collegeville,	W. H. Gristock's Sons.
114	American Linseed Co., New York City,	Old Process Oil Meal,	Halifax,	Smith Bros.
14	W. G. Bishop & Co., Baltimore, Md.,	Old Process Linseed Meal,	Greencastle,	J. R. Davison.
43	*J. W. Evans & Co., Pottstown, Pa.,	Cake Meal,	Schwenksville,	S. H. Longaker & Co.
227	Flint Mill Co., Milwaukee, Wis.,	Green Oval Brand, Old Process,	Elizabethville,	J. A. Rumberger.
6	Metzger Seed & Oil Co., Toledo, O.,	Old Process Oil Meal, Linseed Meal,	Newville,	W. S. Lightner.
95	Metzger Seed & Oil Co., Toledo. O.,	Old Process Oil Meal,	Scranton,	Dickson Mill & Grain Co.
84	Midland Linseed Oil Co., Minneapolis. Minn.,	Old Process Ground Linseed Cake,	Scranton,	H. F. Babcock & Co.
235	National Lead & Oil Co., Pittsburg, Pa.,	Oil Cake Meal,	Patterson,	Manbeck & Nelson.
178	Thompson & Co., Allegheny, Pa.,	Oil Meal,	Ebensburg,	R. Ferguson & Son.

*Shipper, jobber or agent.

TABLE II—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
42	American Linseed Co., Chicago, Ill.,	38.	36.06	....	2.82	Longaker & Co. buy the oil cake from J. W. Evans, and grind in their own mill.
114	American Linseed Co., New York City,	32.	29.31	5.	6.66	
14	W. G. Bishop & Co., Baltimore, Md.,	33.	30.38	7.	6.76	
43	*J. W. Evans & Co., Pottstown, Pa.,	....	34.43	....	7.33	
227	Flint Mill Co., Milwaukee, Wis.,	32.	29.88	5.	6.29	
6	Metzger Seed & Oil Co., Toledo, O.,	....	31.25	....	7.29	
95	Metzger Seed & Oil Co., Toledo, O.,	32.	30.81	5.	6.51	
84	Midland Linseed Oil Co., Minneapolis, Minn.,	32.	30.62	5.5	7.91	
235	National Lead & Oil Co., Pittsburg, Pa.,	32.	35.00	5.2	6.22	
178	Thompson & Co., Allegheny, Pa.,	32.	33.25	5.5	6.95	

*Shipper, agent or jobber.

TABLE III—BUCKWHEAT PRODUCTS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
229	Persing & Cook, Arters, Pa.,	Buckwheat Middlings,	Arters,	Persing & Cook.

TABLE III—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
†229	Persing & Cook, Arters, Pa.,	....	27.13	....	7.53	

TABLE IV—WHEAT PRODUCTS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
	BRAN.			
119	*Jonas F. Eby & Son, Lancaster, Pa.,	Bran,	Washington Boro.,	H. S. Young.
53	W. J. Jennison & Co., Minneapolis, Minn.,	Bran,	Wilkes-Barre,	Jno. Ahlbrandt.
58	The North Western Consolidated Milling Co., Minneapolis, Minn.	Bran,	Wilkes-Barre,	Wilkes-Barre Milling Co.
183	Sheffield-King Milling Co., Minneapolis, Minn.,	Broad Flake Bran,	Windber,	L. B. Reese & Co.
	MIDDLINGS.			
113	Blank & Gotshall, Sunbury, Pa.,	Middlings,	Millersburg,	J. B. Troutman.
80	Blank & Gotshall, Sunbury, Pa.,	White Middlings,	Nanticoke,	T. F. Jacob.
125	*Chapin & Co., Agts., Philadelphia, Pa.,	Pillsbury's Middlings,	Shippensburg,	B. A. Betts.
203	Daisy Roller Mills, Milwaukee, Wis.,	Daisy Flour Middlings,	Montrose,	J. C. Harrington.
63	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	Colonial Middlings,	Wilkes-Barre,	Miner-Hillard Milling Co.
67	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	Winter Wheat Middlings,	Wilkes-Barre,	Miner-Hillard Milling Co.
54	The North Western Consolidated Milling Co., Minneapolis, Minn.	Middlings,	Wilkes-Barre,	Robbins Milling Co.
30	Pillsbury-Washburn Co., Ltd., Minneapolis, Minn.,	Brown Middlings,	Duncannon,	S. S. Sheller.
61	Seymour Carter, Hastings, Minn.,	Snow Ball Flour Middlings,	Wilkes-Barre,	M. W. Morris.
	WHEAT FEED.			
205	American Cereal Co., Chicago, Ill.,	Buckeye Wheat Feed,	Springville,	E. R. Thomas.
204	Geo. T. Evans, Indianapolis, Ind.,	Hoosier Mill Feed,	Montrose,	J. C. Harrington.
107	Rex Mill Co., Kansas City, Mo.,	Mixed Feed,	Carbondale,	Lynch and Bronson.

*Shipper, agent or jobber.

TABLE IV—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
	BRAN.					
119	*Jonas F. Eby & Son., Lancaster. Pa.,	....	14.50	....	4.32	
53	W. J. Jennison & Co., Minneapolis. Minn.,	....	17.12	....	4.95	
58	The North Western Consolidated Milling Co., Minneapolis, Minn.	....	16.19	....	4.93	
183	Sheffield-King Milling Co., Minneapolis, Minn.,	....	15.59	....	4.62	
	MIDDLINGS.					
113	Blank & Gotshall, Sunbury, Pa.,	....	17.34	....	4.33	Contains about 10 per cent. of weed seed ground, chiefly false buckwheat.
80	Blank & Gotshall, Sunbury, Pa.,	....	15.22	....	3.26	
125	Chapin & Co., Phila., Pa.,	....	16.47	....	4.79	
203	Daisy Roller Mills, Milwaukee, Wis.,	....	17.63	....	4.57	Contains about 15 per cent. of a corn product resembling hominy chop.
63	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	13.56	14.87	6.83	6.01	
67	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	....	15.88	....	4.37	
54	The North Western Consolidated Milling Co., Minneapolis, Minn.	....	18.06	....	5.47	
30	Pillsbury-Washburn Co., Ltd., Minneapolis, Minn.,	....	18.31	....	5.17	
61	Seymour Carter, Hastings, Minn.,	....	18.19	....	5.15	
	WHEAT FEED.					
205	American Cereal Co., Chicago, Ill.,	17.75	15.69	4.70	4.46	
204	Geo. T. Evans, Indianapolis, Ind.,	....	16.25	....	4.68	
107	Rex Mill Co., Kansas City, Mo.,	....	16.75	....	4.17	

TABLE V—RYE PRODUCTS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
206	Atlas Feed & Milling Co., Peoria, Ill.,	Economy Rye Gluten Meal,	Harford,	W. W. Wilmarth.
45	*R. B. Delp, Allentown, Pa.,	Rye Feed,	Pennsboro,	Hillegass & Krauss.
24	W. H. Kepner, Newport, Pa.,	Rye Chop,	Newport,	J. F. Fickes.
37	Jos. H. Kreider & Son, Annville, Pa.,	Rye Chop,	Annville,	Jas. H. Kreider & Son.
46	Mauser Mill Co., Treichlers, Pa.,	Rye Chop,	Mauch Chunk,	C. A. Rex.
166	Geo. W. Smith, Clearfield, Pa.,	Rye Chop,	Clearfield,	Geo. W. Smith.

*Shipper, agent or jobber.

TABLE VI—BARLEY PRODUCTS.

1	E. P. Mueller, Milwaukee, Wis.,	Malt Sprouts,	Lancaster,	Jno. W. Eshelman.
182	*Jno. H. Miller, Tyrone, Pa.,	Barley Chop,	Windber,	Crisman & Blackburn.
224	Pioneer Cereal Co., Akron, O.,	Pioneer Barley Feed,	Port Matilda,	J. M. Williams.

*Shipper, agent or jobber.

TABLE V—RYE PRODUCTS.

Sample number	Manufacturer	Composition (Per cent.) Protein. Guaranteed.	Composition (Per cent.) Protein. Found.	Composition (Per cent.) Fat. Guaranteed.	Composition (Per cent.) Fat. Found.	Remarks.
		Per cent.	Per cent.	Per cent.	Per cent.	
206	Atlas Feed & Milling Co., Peoria, Ill.,	23.	19.06	4.7	7.20	Evidently a distillery product; barley hulls present.
45	*R. B. Delp, Allentown, Pa.,		14.94		3.24	
24	W. H. Kepner, Newport, Pa.,		12.19		1.91	
37	Jos. H. Kreider & Son, Annville, Pa.,		12.		2.13	Contains a few per cent. of some corn product.
46	Mauser Mill Co., Treichlers, Pa.,		11.75		2.63	
†166	Geo. W. Smith, Clearfield, Pa.,		10.75		1.86	

*Shipper, agent or jobber.

TABLE VI—BARLEY PRODUCTS.

		Per cent.	Per cent.	Per cent	Per cent.	
1	E. P. Mueller, Milwaukee, Wis.,		30.56		2.05	
182	*Jno. H. Miller, Tyrone, Pa.,		11.41		3.48	
224	Pioneer Cereal Co., Akron, O.,	15.00	12.88	4.61	3.25	

*Shipper, agent or jobber.

TABLE VII—OAT PRODUCTS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
	OAT FEEDS.			
13	The American Cereal Co., Chicago, Ill.,	Vim Oat Feed,	Greencastle,	Greencastle Elevator Co.
115	*Chapin & Co., The Bourse, Philadelphia, Pa.,	Illinois Oat Feed,	Elizabethtown,	B. G. Groff.
197	The Great Western Cereal Co., Chicago, Ill.,	Friend's Oat Feed,	Hawley,	Ernest Vogler.
196	The Great Western Cereal Co., Chicago, Ill.,	Great Western Dairy Feed,	Honesdale,	R. W. Penwarden.
112	The Great Western Cereal Co., Chicago, Ill.,	Oat Feed,	York,	H. S. Myers.
185	The Great Western Cereal Co., Chicago, Ill.,	Royal Oat Feed,	Johnstown,	W. H. Reitz.
186	National Oatmeal Co., Davenport, Ia.,	Iowa Oat Feed,	Johnstown,	W. G. Heffley.
195	*Jno. B. Yeager & Co., Wilkes-Barre, Pa.,	Oat Feed,	Honesdale,	R. W. Penwarden.

*Shipper, agent or jobber.

TABLE VII—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
	OAT FEEDS.					
13	The American Cereal Co., Chicago, Ill.,	7.50	7.25	2.75	3.13	Contains a few foreign seeds.
115	*Chapin & Co., The Bourse, Philadelphia, Pa.,	....	6.25	....	1.82	Contains a little wheat.
197	Great Western Cereal Co., Chicago, Ill.,	7.87	7.22	3.24	3.12	Some whole oats present.
196	Great Western Cereal Co., Chicago, Ill.,	12.25	9.00	3.20	3.00	Traces of corn product found.
112	Great Western Cereal Co., Chicago, Ill.,	....	5.88	....	2.85	
185	Great Western Cereal Co., Chicago, Ill.,	7.53	5.66	2.65	2.26	Contains some impurities.
186	National Oatmeal Co., Davenport, Ia.,	....	7.50	....	3.50	
195	*Jno. B. Yeager & Co., Wilkes-Barre, Pa.,	....	3.41	....	1.25	Almost exclusively oat hulls.

*Shipper, agent or jobber.

TABLE VIII—CORN PRODUCTS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
	SIMPLE MILLING PRODUCTS.			
41	F. J. Clamer, Collegeville, Pa.,	Cob Corn Chop,	Collegeville,	F. J. Clamer.
232	Richard Greenwood, Philadelphia, Pa.,	Corn Meal,	Philadelphia,	Jas. B. Paxson.
23	W. H. Kepner, Newport, Pa.,	Ground Ear Corn,	Newport,	B. F. Horting.
132	Geo. W. Keiter, Bloomsburg, Pa.,	Pure Chop,	Bloomsburg,	J. K. Pensyl.
51	Millard & Scureman, Kingston, Pa.,	Corn Cob,	Kingston,	Millard & Scureman.
232	L. F. Miller & Sons, Philadelphia, Pa.,	Corn Meal,	Philadelphia,	H. Beidler & Co.
66	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	Roller Meal,	Wilkes-Barre,	Miner-Hillard Milling Co.
168	*E. H. Morey, Toledo, O.,	Cob Meal,	Clearfield,	F. M. Cardon.
38	Joseph Rapp, Phoenixville, Pa.,	Corn Chop,	Phoenixville,	M. Longabough.
180	Toledo Grain & Milling Co., Toledo, O.,	Ordinary Feed Meal,	Hastings,	James McNelis.
	CORN BRAN.			
190	*Jas. L. King, West Chester, Pa.,	White Corn Bran,	Philadelphia,	Fred L. Lemont.
39	W. J. Koeh & Co., Philadelphia, Pa.,	White Corn Bran,	Phoenixville,	W. H. Lenhard.
	GLUTEN FEEDS.			
234	Edwin Delp & Co., Philadelphia, Pa.,	Gluten Feed,	Philadelphia,	Geo. Egolf & Co.
202	The Glucose Sugar Refining Co., Chicago, Ill.,	Buffalo Gluten Feed,	Meshoppen,	Gregory & Dougherty.
118	The Glucose Sugar Refining Co., Chicago, Ill.,	Gluten Feed,	Rheems,	S. G. Graybill.
	HOMINY FEED.			
223	*Toledo Elevator Co., Toledo, O.,	Hominy Feed,	Skinner's Eddy,	G. M. Kline.
	HOMINY MEAL.			
62	*Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	White Hominy Meal,	Wilkes-Barre,	Miner-Hillard Milling Co.
	OTHER PRODUCTS.			
44	*Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	Flakaline,	Pennsburg,	Hillegass & Krauss.
122	*C. W. Wagar, Philadelphia, Pa.,	Maizelene,	Atglen,	W. S. Hastings & Son.

*Shipper, agent or jobber.

TABLE VIII—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
	SIMPLE MILLING PRODUCTS.					
†41	F. J. Clamer, Collegeville, Pa.,	....	7.56	....	1.16	
232	Richard Greenwood, Philadelphia, Pa.,	....	8.25	....	3.46	
†23	W. H. Kepner, Newport, Pa.,	....	7.00	....	3.34	
†132	Geo. W. Keiter, Bloomsburg, Pa.,	....	7.63	....	2.78	
†51	Millard & Scureman, Kingston, Pa.,	9.64	9.69	5.33	2.14	67.32 per cent. nitrogen-free extract guaranteed.
232	L. F. Miller & Son, Philadelphia, Pa.,	....	8.69	....	3.83	Is granulated corn cob.
†66	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	10.87	7.69	8.46	2.14	
168	*E. H. Morey, Toledo, O.,	....	1.59	....	.52	
†38	Jas. Rapp, Phoenixville, Pa.,	....	8.50	....	4.33	
†180	Toledo Grain & Milling Co., Toledo, O.,	8.31	7.41	3.60	2.85	
	CORN BRAN.					
190	*Jos. L. King, West Chester, Pa.,	....	9.06	....	4.91	Considerable corn starch present.
39	W. J. Koch & Co., Philadelphia, Pa.,	....	10.13	....	8.11	
	GLUTEN FEEDS.					
234	Edwin Delp & Co., Philadelphia, Pa.,	....	35.00	....	6.22	
†202	The Glucose Sugar Refining Co., Chicago, Ill.,	28.00	10.38	3.00	4.81	Much corn starch present.
118	The Glucose Sugar Refining Co., Chicago, Ill.,	24.00	24.00	10.06	2.89	Some cob present.
	HOMINY FEED.					
223	*Toledo Elevator Co., Toledo, O.,	12.60	9.31	8.57	6.74	
	HOMINY MEAL.					
62	*Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	12.00	10.25	9.00	6.08	
	OTHER PRODUCTS.					
44	*Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	....	10.56	....	7.96	
122	*C. W. Wagar, Philadelphia, Pa.,	....	9.75	....	7.03	

TABLE IX—MIXED FEEDS FROM NAMED GRAINS.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
	CORN AND OATS.			
120	American Cereal Co., Chicago, Ill.,	Victor Corn and Oat Feed,	Christiana,	B. F. Walter.
28	S. P. Bacastow, Boiling Springs, Pa.,	Corn and Oats Chop,	Boiling Springs,	W. H. Myers.
8	S. J. Baer, Middletown, Pa.,	Corn and Oats Chop,	Highspire,	Joseph M. Sauder.
26	U. G. Barnitz, Barnitz, Pa.,	Corn and Oats Chop,	Mt. Holly Springs,	J. W. Whitmer.
18	M. A. Bateman, Benfer, Pa.,	Corn and Oats Feed,	Beavertown,	W. M. Keller.
17	M. S. Benfer, Beaver Springs, Pa.,	Corn and Oats Chop,	Beavertown,	W. M. Keller.
237	T. H. Buttorf, Newport, Pa.,	Corn and Oats Chop,	Newport,	T. H. Buttorf.
231	Buffalo Milling Co., Ltd., Lewisburg, Pa.,	Corn and Oats Chop,	Lewisburg,	Buffalo Milling Co., Ltd.
21	C. Burkhardt Chambersburg, Pa.,	Corn and Oats Chop,	Chambersburg,	C. Burkhardt.
129	Campbell & Argrave, Mausdale, Pa.,	Corn and Oats Chop,	Mausdale,	Campbell & Argrave.
128	The Danville Milling Co., Danville, Pa.,	Corn and Oat Chop,	Danville,	J. F. Tooley.
3	Dewees & Bracken, Paoli, Pa.,	Corn and Oats Chop,	Rosemont,	Lippincott & Eadle.
16	Elder & Eckbert, Lewistown, Pa.,	Corn and Oats Chop,	Lewistown,	Elder & Eckbert.
200	Ellsworth & Co., Buffalo, N. Y.,	Corn and Oat Feed,	Pittston,	Benedict & Barber.
4	Henry Graybill, Carlisle, Pa.,	Corn and Oats Chop,	Carlisle,	Wm. Treverton & Son.
137	Great Western Cereal Co., Chicago, Ill.,	Excelsior Corn and Oat Feed,	Frankstown,	F. & I. Mentzer.
207	Great Western Cereal Co., Chicago, Ill.,	Excelsior Corn and Oat Feed,	New Milford,	H. B. Carpenter & Co.
189	Great Western Cereal Co., Chicago, Ill.,	Boss Corn and Oat Feed,	Upper Darby,	V. E. Bond.
169	C. F. Hays, Curwensville, Pa.,	Corn and Oats Chop,	Bridgeport,	C. F. Hays.
242	Hoffer & Garman, Harrisburg, Pa.,	Corn and Oats Chop,	Marysville,	S. G. Gelb.
81	Husted Milling & Elevator Co., Buffalo, N. Y.,	Corn and Oats, ½ and ½,	Nanticoke,	Merchants Supply Dept. Store.
209	Husted Milling & Elevator Co., Buffalo, N. Y.,	Corn and Oats, ½ and ½,	Great Bend,	B. S. Galloway.
187	John B. Isett, Spruce Creek, Pa.,	Corn and Oat Feed,	Huntingdon,	Stauffer & Brenaman.
226	John B. Isett, Spruce Creek, Pa.,	Standard Corn and Oats,	Spruce Creek,	Jno. B. Isett.
27	S. B. Jackson, Carlisle, Pa.,	Corn and Oats Mixed Chop,	Mt. Holly Springs,	J. N. Weigel.
22	W. H. Kepner, Newport, Pa.,	Corn, Cob and Oats Chop,	Newport,	W. H. Kepner.
25	W. H. Kepner, Newport, Pa.,	Corn and Oats Chop,	Newport,	J. F. Fickes.
36	Jos. H. Kreider & Son, Annville, Pa.,	Corn and Oats Chop,	Annville,	Jos. H. Kreider & Son.
32	Lewis L. Leonard, Patterson, Pa.,	Corn and Oats Chop,	Port Royal,	Geo. G. Crozier.

TABLE IX—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
	CORN AND OATS.	Per cent.	Per cent.	Per cent.	Per cent.	
120	American Cereal Co., Chicago, Ill.,	9.00	9.06	4.00	4.11	
†28	S. P. Bacastow, Boiling Springs, Pa.,		7.88		3.16	
8	S. J. Baer, Middletown, Pa.,		11.06		3.59	Some wheat product present.
†26	U. G. Barnitz, Barnitz, Pa.,		8.12		3.10	
†18	M. J. Bateman, Benfer, Pa.,		11.44		2.17	
†17	M. S. Benfer, Beaver Springs, Pa.,		10.75		1.99	Considerable wheat product present.
237	T. H. Buttorf, Newport, Pa.,		9.13		3.49	
231	Buffalo Milling Co., Ltd., Lewisburg, Pa.,		9.50		3.97	Some wheat product present.
21	C. Burkhardt, Chambersburg, Pa.,		10.13		3.84	A little wheat and false buckwheat products present.
129	Campbell & Argrave, Mausdale, Pa.,		9.06		3.04	Considerable wheat product present.
128	The Danville Milling Co., Danville, Pa.,		9.22		3.72	
3	Dewees & Bracken, Paoli, Pa.,		10.88		3.85	Much wheat product present.
16	Elder & Eckbert, Lewistown, Pa.,		9.44		4.00	Considerable wheat product present.
200	Ellsworth & Co., Buffalo, N. Y.,	8.30	8.03	3.00	3.07	Considerable wheat product present.
4	Henry Graybill, Carlisle, Pa.,		10.31		4.28	Considerable wheat product present.
137	Great Western Cereal Co., Chicago, Ill.,	8.21	8.18	4.58	4.55	
207	Great Western Cereal Co., Chicago, Ill.,	9.00	8.41	4.20	5.52	
189	Great Western Cereal Co., Chicago, Ill.,	8.27	8.00	3.65	4.19	
169	C. F. Hays, Curwensville, Pa.,		8.94		3.89	
242	Hoffer & Garman, Harrisburg, Pa.,		9.31		3.43	A little wheat product present.
†81	Husted Milling & Elevator Co., Buffalo, N. Y.,		10.50		3.60	Considerable wheat product present.
209	Husted Milling & Elevator Co., Buffalo, N. Y.,		8.84		4.21	
187	John B. Isett, Spruce Creek, Pa.,		9.00		4.84	
226	John B. Isett, Spruce Creek, Pa.,	10.43	10.81	4.38	5.00	
†27	S. B. Jackson, Carlisle, Pa.,		11.06		2.09	Considerable wheat product present.
†22	W. H. Kepner, Newport, Pa.,		9.19		2.26	Cob present.
†25	W. H. Kepner, Newport, Pa.,		9.72		2.70	
36	Jos. H. Kreider & Son, Annville, Pa.,		10.88		3.42	Much wheat present.
†32	Lewis L. Leonard, Patterson, Pa.,		9.47		3.59	

TABLE IX—Continued.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
171	J. Reese Pantall & Son, Punxsutawney, Pa.,	Corn and Oats Chop,	Mahaffey,	B. W. McCracken.
241	Paxton Flour & Feed Co., Ltd., Harrisburg, Pa.,	Corn and Oats Chop,	Marysville,	S. W. Clouser & Co.
40	J. C. Pennypacker & Co., Mt. Clare, Pa.,	Corn and Oats Chop,	Mt. Clare,	J. C. Pennypacker.
160	Platt, Barber Co., Philipsburg, Pa.,	C. O. Chop,	Houtzdale,	John O'Conner.
238	Fred. Pontz, Lancaster, Pa.,	Corn and Oats Chop,	Lancaster,	Fred. Pontz.
239	Fred. Pontz, Lancaster, Pa.,	Corn and Oats Chop,	Lancaster,	Fred. Pontz.
109	P. A. & S. Small, York, Pa.,	Corn and Oats. Chop,	York,	P. A. & S. Small.
35	A. Strickler's Sons, Lebanon, Pa.,	Corn and Oats Chop,	Lebanon,	A. Strickler's Sons.
33	E. Strickler's Sons, Lebanon, Pa.,	Corn and Oats Chop,	Lebanon,	E. Strickler's Sons.
34	Geo. Strickler & Yingst, Lebanon, Pa.,	Corn and Oats Chop,	Lebanon,	Geo. Strickler & Yingst.
10	Elwood Sutton. Eberly's Mills, Pa.,	Corn and Oats Chop,	West Fairview,	E. E. Eslinger.
218	Thompson & Price, Sayre, Pa.,	Corn and Oats Chop,	Athens,	John D. Fice.
177	Sherman Tibbott, Ebensburg, Pa.,	Corn and Oats Chop,	Ebensburg,	Sherman Tibbott.
157	Warrick Bros., Houtzdale, Pa.,	Corn and Oats Chop,	Ramey,	H. E. Wagner.
240	J. J. Weh, Lancaster, Pa.,	Corn and Oats Chop,	Lancaster,	J. J. Weh.
15	White Bros., Maitland. Pa.,	Corn and Oats Chop,	Lewistown,	White Bros.
19	Wilson & Maclay, Belleville, Pa.,	Corn and Oats Chop,	Belleville,	Wilson & Maclay.
170	Wood & McKenrick, Grampian, Pa.,	Corn and Oats Chop,	Grampian,	M. E. Fox.
236	J. T. Zook, Patterson, Pa.,	Corn and Oats Chop,	Patterson,	J. T. Zook.
	CORN, OATS AND BARLEY.			
79	American Cereal Co., F. Schumaker & Co., Akron, O.,	Stock Feed (Corn, Oats and Barley),	Nanticoke.	T. F. Jacob.
127	American Cereal Co., F. Schumaker & Co., Akron, O.,	F. S. Stock Feed,	Hellam,	F. W. Foust.
153	Toledo Grain & Milling Co., Toledo, O.,	C. O. B. Chop,	Osceola Mills,	T. C. Heims.
	RYE AND OATS.			
138	Klepser Bros., Martinsburg, Pa.,	Rye and Oats,	Martinsburg,	Klepser Bros.
143	Spanogle & Yeager, Lewistown, Pa.,	Rye and Oats,	Altoona,	James Morgan.
176	Sybert Bros., Wildwood, Pa.,	Rye and Oats Chop,	Cresson,	H. J. Eberly.
173	Toledo Grain & Milling Co., Toledo, O.,	Rye and Oats Chop,	Patton,	Patton Supply Co.

TABLE IX—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
171	J. Reese Pantall & Son, Punxsutawney, Pa.,		7.56		3.49	
241	Paxton Flour & Feed Co., Ltd., Harrisburg, Pa.,		9.00		3.57	A little wheat present.
†40	J. C. Pennypacker & Co., Mt. Clare, Pa.,		9.25		3.80	
†160	Platt Barber Co., Philipsburg, Pa.,		8.91		2.54	Buckwheat product in quantity.
238	Fred. Pontz, Lancaster, Pa.,		9.31		3.99	
239	Fred. Pontz, Lancaster, Pa.,		9.56		3.70	
109	P. A. & S. Small, York, Pa.,		8.94		2.96	Considerable wheat product.
35	A. Strickler's Sons, Lebanon, Pa.,		10.38		4.24	A little wheat product.
†33	E. Strickler's Sons, Lebanon, Pa.,		12.25		2.29	Considerable wheat product.
†34	Geo. Strickler & Yingst, Lebanon, Pa.,		9.25		2.31	A little wheat product.
†10	Elwood Sutton, Eberly's Mills, Pa.,		8.44		2.10	
218	Thompson & Price, Sayre, Pa.,		8.75		3.83	
†177	Sherman Tibbott, Ebensburg, Pa.,		10.31		2.47	
157	Warrick Bros., Houtzdale, Pa.,		7.84		3.26	
240	J. J. Weh, Lancaster, Pa.,		11.56		4.03	Considerable wheat product.
†15	White Bros., Maitland, Pa.,		10.81		2.40	Considerable wheat product.
19	Wilson & Maclay, Belleville, Pa.,		11.31		3.64	Considerable wheat product.
170	Wood & McKenrick, Grampian, Pa.,		9.69		3.95	
236	J. T. Zook, Patterson, Pa.,		9.13		4.33	
	CORN, OATS AND BARLEY.					
79	American Cereal Co., F. Schumaker & Co., Akron, O.,	13.00	11.94	5.00	4.63	
127	American Cereal Co., F. Schumaker & Co., Akron, O.,	13.00	12.44	5.00	4.32	
153	Toledo Grain & Milling Co., Toledo, O.,	9.06	7.72	4.33	4.23	
	RYE AND OATS.					
138	Klepser Bros., Martinsburg, Pa.,	7.00	12.22	3.00	2.80	Wheat present.
143	Spanogle & Yeager, Lewistown, Pa.,		9.75		3.70	Wheat present.
†176	Sybert Bros., Wildwood, Pa.,		11.31		1.70	
173	Toledo Grain & Milling Co., Toledo, O.,		11.72		2.74	Some wheat present.

TABLE IX—Continued.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
	CORN, RYE AND OATS.			
179	Adolfzen & Hammerstrom. Hastings, Pa.,	Corn, Oats and Rye,	Hastings,	Adolfzen & Hammerstrom.
65	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	No. 1, Corn, Rye and Oats Chop,	Wilkes-Barre,	Miner-Hillard Milling Co.
70	Samuel Raub & Son, Luzerne, Pa.,	Corn, Rye and Oats Chop,	Luzerne,	Samuel Raub & Son.
110	P. A. & S. Small, York, Pa.,	Corn, Oats and Rye Chop.	York.	P. A. & S. Small.
156	Warrick Bros., Houtzdale, Pa.,	Corn, Oats and Rye,	Ramey,	H. E. Wagner.

TABLE IX—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
	CORN, RYE AND OATS.					
†179	Adolfzen & Hammerstrom, Hastings, Pa.,	....	10.37	....	2.31	
†65	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	10.60	9.75	5.43	2.20	Rye not abundant.
†70	Samuel Raub & Son, Luzerne, Pa.,	....	11.00	....	3.34	Wheat more abundant than rye.
†110	P. A. & S. Small, York, Pa.,	....	9.38	....	3.02	
156	Warrick Bros., Houtzdale, Pa.,	....	12.63	....	3.09	

TABLE X—MIXED FEEDS FROM MATERIALS NOT NAMED IN THE BRAND.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
	I. PROPRIETARY BRANDS.			
	(a) Non-Condimental.			
191	American Cereal Co., Chicago, Ill.,	American Poultry Feed,	Pottstown,	M. B. Tyson & Son.
12	American Cereal Co., Chicago, Ill.,	Quaker Dairy Feed,	Greencastle,	Greencastle Elevator Co.
7	J. W. Biles, Cincinnati, O.,	Fourex Grain,	Mechanicsburg,	A. B. Harnish.
216	Dayton Milling Co., Towanda, Pa.,	Champion Feed,	Towanda,	Dayton Milling Co.
20	Great Western Cereal Co., Chicago, Ill.,	Dairy Feed,	Chambersburg,	D. W. Foust & Son.
9	Hammond Distilling Co., (address not given),	Gluten Feed (Ajax Flakes),	Bridgeport,	Paxton Flour & Feed Co.
213	Harvey Holdridge, Susquehanna, Pa.,	"C" Chop,	Oakland borough,	Harvey Holdridge.
214	Harvey Holdridge, Susquehanna, Pa.,	"X" Chop,	Oakland borough,	Harvey Holdridge.
123	H. O. Company, Buffalo, N. Y.,	H. O. Horse Feed,	Coatesville,	J. T. Gay & Son.
99	Husted Milling & Elevator Co., Buffalo, N. Y.,	Monarch Chop,	Scranton,	Max Roth.
210	Kentucky Milling Co., Henderson, Ky.,	Jersey Mixed Feed,	Nicholson,	C. L. Spencer & Son.
184	The Tingle & Drake Co., Zanesville, O.,	O. H. Dairy Feed,	Windber,	L. B. Reese & Co.
85	*John W. Metzler, Binghamton, N. Y.,	Alcedo Stock Food,	Scranton,	H. F. Babcock & Co.
106	Robinson Milling Co., Carbondale, Pa.,	Dexter Feed,	Carbondale,	Carbondale Milling Co.
172	W. B. Stephenson, Mahaffey, Pa.,	Kow Feed,	Mehaffey,	W. B. Stephenson.
154	Toledo Grain & Milling Co., Toledo, O.,	Keystone Chop,	Osceola Mills,	T. C. Heims.
199	A. Waller & Co., Henderson, Ky.,	Blue Grass Mixed Feed,	Forest City,	H. H. Finn.
	(b) CONDIMENTAL.			
121	Acme Food Co., Chicago, Ill.,	Acme Food,	Christiana,	B. F. Walter.
198	J. W. Barwell, Waukegan, Ill.,	Sugar and Flax Seed Feed,	Honesdale,	R. W. Penwarden.
	II. BRANDS NOT PROPRIETARY.			
193	Wm. Ackerman, Stroudsburg, Pa.,	Mixed Chop,	Stroudsburg,	Wm. Ackerman.
83	H. F. Babcock & Co., Scranton, Pa.,	Mixed Chop,	Scranton,	H. F. Babcock & Co.
139	Bare Milling Co., Roaring Springs, Pa.,	Mixed Chop,	Roaring Springs,	Bare Milling Co.
152	W. T. Barndollar, Olivia, Pa.,	Horse Chop,	Bald Eagle,	W. T. Barndollar.
77	Bergin & Co., Nanticoke, Pa.,	No. 1 Chop,	Nanticoke,	Bergin & Co.

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*Agent, shipper or jobber.

TABLE X—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
	I. PROPRIETARY BRANDS.					
	(a) Non-Condimental.					
191	American Cereal Co., Chicago, Ill.,	14.00	13.66	4.50	5.86	Corn, oats and wheat feed.
12	American Cereal Co., Chicago, Ill.,	14.00	14.06	3.50	3.54	Oats with some wheat and corn.
7	J. W. Biles, Cincinnati, O.,	33.00	32.81	11.00	10.57	Distiller's grains, corn and barley.
216	Dayton Milling Co., Towanda, Pa.,	....	7.03	....	4.04	Corn and oat products.
20	Great Western Cereal Co., Chicago, Ill.,	12.25	8.19	3.20	2.69	Corn, with some cobs, and oat product.
9	Hammond Distilling Co.,	34.00	33.00	12.00	11.92	Distiller's grains, barley and corn.
†213	Harvey Holdridge, Susquehanna, Pa.,	....	8.50	....	3.85	Corn and oats.
†214	Harvey Holdridge, Susquehanna, Pa.,	....	9.22	....	4.12	Corn and oats.
123	H. O. Company, Buffalo, N. Y.,	12.00	12.31	4.50	4.36	Corn and oat, wheat and rye products.
†99	Husted Milling & Elevator Co., Buffalo, N. Y.,	....	9.37	....	6.07	Corn and oats.
210	Kentucky Milling Co., Henderson, Ky.,	11.56	12.00	3.65	3.29	Wheat feed and corn cobs.
184	The Tingle & Drake Co., Zanesville, O.,	12.55	11.81	5.27	3.08	Oat and wheat products.
†85	*John W. Metzler, Binghamton, N. Y.,	....	8.50	....	4.01	Corn and oat products and a little wheat.
†106	Robinson Milling Co., Carbondale, Pa.,	11.03	9.13	4.32	2.48	Corn and oats.
172	W. B. Stephenson, Mehaffey, Pa.,	....	11.31	....	3.89	Corn, oat, buckwheat and wheat products.
154	Toledo Grain & Milling Co., Toledo, O.,	9.54	9.91	5.73	3.22	Corn and oat products.
199	A. Waller & Co., Henderson, Ky.,	12.59	11.06	3.19	3.02	Wheat feed and corn cob.
	(b) CONDIMENTAL.					
121	Acme Food Co., Chicago, Ill.,	....	18.44	....	6.52	Linseed and corn meals, with salt and a little bitter substance.
198	J. W. Barwell, Waukegan, Ill.,	28.25	27.81	11.25	10.90	Flaxseed, beans, corn bran and condiments.
	II. BRANDS NOT PROPRIETARY.					
193	Wm. Ackerman, Stroudsburg, Pa.,	....	10.47	....	4.50	Wheat and corn.
83	H. F. Babcock & Co., Scranton, Pa.,	....	14.31	....	4.34	Wheat, corn and oat products.
139	Bare Milling Co., Roaring Springs, Pa.,	....	11.84	....	4.31	Wheat and corn, with a little oats
152	W. T. Barndollar, Olivia, Pa.,	....	11.06	....	3.35	Wheat, rye, corn and oats.
†77	Bergin & Co., Nanticoke, Pa.,	....	10.00	....	2.75	Corn and oats.

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*Agent, shipper or jobber.

TABLE X—Continued.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
78	Bergin & Co., Nanticoke, Pa.,	Mixed Chop,	Nanticoke,	Bergin & Co.
228	Blank & Gottshall, Sunbury, Pa.,	Mixed Chop,	Sunbury,	G. M. Conrad.
117	J. F. Binkley, Elizabethtown, Pa.,	Mixed Chop,	Elizabethtown,	J. F. Binkley.
135	G. W. Brown, Williamsburg, Pa.,	Mixed Chop,	Williamsburg,	G. W. Brown.
150	D. Buck & Co., Fleming, Pa.,	Mixed Chop,	Unionville,	D. Buck & Co.
225	D. Buck & Co., Fleming, Pa.,	Mixed Chop,	Port Matilda,	S. R. Pringle.
138	Buffalo Cereal Co., Buffalo, N. Y.,	Horse Feed,	Philadelphia,	R. Gilmore.
104	The Carbondale Milling Co., Carbondale, Pa.,	No. 1 Feed,	Carbondale,	The Carbondale Milling Co.
105	The Carbondale Milling Co., Carbondale, Pa.,	No. 2 Feed,	Carbondale,	The Carbondale Milling Co.
140	Clapper Bros., Martinsburg, Pa.,	Horse Chop,	Martinsburg,	Clapper Bros.
167	F. M. Cardon, Clearfield, Pa.,	Mixed Chop,	Clearfield,	F. M. Cardon.
92	Dickson Mill & Grain Co., Scranton, Pa.,	Feed,	Scranton,	Ziman Bros.
93	Dickson Mill & Grain Co., Scranton, Pa.,	Feed,	Scranton,	Dickson Mill & Grain Co.
94	Dickson Mill & Grain Co.. Scranton, Pa.,	Best Feed,	Scranton,	Dickson Mill & Grain Co.
165	J. W. Eberts & Co., Clearfield, Pa.,	Mixed Chop,	Clearfield,	J. W. Eberts & Co.
194	Aaron Fowler, North Water Gap, Pa.,	Mixed Chop,	Stroudsburg,	Smoyer Bros.
68	James Fowler & Sons, Wyoming, Pa.,	Mixed Chop,	West Wyoming,	James Fowler & Sons.
69	James Fowler & Sons, Wyoming, Pa.,	No. 1 Chop,	West Wyoming,	James Fowler & Sons.
108	H. L. Freas & Son, Jermyn, Pa.,	Mixed Chop,	Jermyn,	H. L. Freas & Son.
97	W. B. Freas & Son, Scranton, Pa.,	Mixed Feed,	Scranton,	W. B. Freas & Son.
162	C. T. Fryberger, Philipsburg, Pa.,	No. 1 Mixed Chop,	Philipsburg,	C. T. Fryberger.
144	John Fuoss, Bellwood, Pa.,	Horse Chop,	Bellwood,	John Fuoss.
145	Fuoss Bros., Tyrone. Pa.,	Horse Feed,	Tyrone,	Fuoss Bros.
174	J. W. Gill, Coalport, Pa.,	Mixed Horse Chop,	Coalport,	J. W. Gill.
5	James G. Ginter, Newville. Pa.,	Mixed Chop,	Newville,	W. S. Lightner.
96	E. E. Hackett, Wynwood, Pa.,	Mixed Feed,	Scranton,	M .Dinner.
217	F. H. Hagerman, Towanda, Pa.,	Mixed Chop,	Towanda,	F. H. Hagerman.
155	B. W. Hess, Houtzdale, Pa.,	Mixed Chop,	Osceola Mills,	Michael Griffey.
103	Geo. Hilwig & Sons. Priceburg. Pa.,	Mixed Chop,	Priceburg,	Geo. Hilwig & Sons.
130	Ikeler & Fleckenstine, Bloomsburg, Pa.,	Mixed Chop.	Bloomsburg,	J. D. Armstrong.

TABLE X—Continued.

Sample number.	Manufacturer.	Composition (Per cent.) Protein. Guaranteed.	Composition (Per cent.) Protein. Found.	Composition (Per cent.) Fat. Guaranteed.	Composition (Per cent.) Fat. Found.	Remarks
		Per cent.	Per cent.	Per cent.	Per cent.	
†78	Bergin & Co., Nanticoke, Pa.,	10.85	10.56	5.61	2.59	Corn, with some oats and wheat.
228	Blank & Gottshall, Sunbury, Pa.,		10.00		3.88	Corn and oats.
†117	J. F. Binkley, Elizabethtown, Pa.,		9.91		3.16	Corn, wheat, rye and oat products.
135	G. W. Brown, Williamsburg, Pa.,	10.00	9.41	3.30	3.41	Corn and cob, with oats.
150	D. Buck & Co., Fleming, Pa.,	9.00	12.22	3.00	4.15	Corn, oats and wheat.
225	D. Buck & Co., Fleming, Pa.,	9.00	10.38	3.00	5.41	Corn, wheat and oat products.
188	Buffalo Cereal Co., Buffalo, N. Y.,		11.94		4.64	Corn, wheat and oats, with a little oil meal.
†104	The Carbondale Milling Co., Carbondale, Pa.,		9.13		3.11	Corn and oat products.
†105	The Carbondale Milling Co., Carbondale, Pa.,		12.19		3.63	Corn and oat products.
140	Clapper Bros., Martinsburg, Pa.,	9.50	10.44	4.50	2.23	Wheat, rye and oat products.
167	F. M. Cardon, Clearfield, Pa.,		11.31		3.42	Corn, oat products, wheat and rye feeds.
92	Dickson Mill & Grain Co., Scranton, Pa.,		9.08		6.34	Corn and oat products.
93	Dickson Mill & Grain Co., Scranton, Pa.,		9.25		7.34	Corn and oat products.
†94	Dickson Mill & Grain Co., Scranton, Pa.,		8.97		2.76	Corn and oats.
165	J. W. Eberts & Co., Clearfield, Pa.,		9.91		3.52	Corn, wheat and rye middlings and a little oats.
194	Aaron Fowler, North Water Gap, Pa.,		8.91		4.83	Corn and oats.
†68	James Fowler & Sons, Wyoming, Pa.,		8.00		1.94	Corn and oats.
†69	James Fowler & Sons, Wyoming, Pa.,		9.94		3.01	Corn, oats and wheat product.
†108	H. L. Freas & Son, Jermyn, Pa.,		7.94		2.79	Corn and oat hulls.
†97	W. B. Freas & Son, Scranton, Pa.,		7.06		2.19	Corn and oat hulls.
162	C. T. Fryberger, Phillpsburg, Pa.,		10.34		5.15	Corn with cob, and wheat products.
144	John Fuoss, Bellwood, Pa.,		9.94		2.88	Corn, wheat products and a little oats.
145	Fuoss Bros., Tyrone, Pa.,		9.09		4.31	Corn, wheat middlings and oat feed.
174	J. W. Gill, Coalport, Pa.,		11.72		3.63	Corn with wheat products.
5	James G. Ginter, Newville, Pa.,		11.13		2.79	Wheat middlings, corn and oat feed.
†96	E. E. Hackett & Co., Wynwood, Pa.,		8.25		4.70	Corn and oat products.
217	F. H. Hagerman, Towanda, Pa.,		7.88		3.98	Corn with cob and oats products.
155	B. W. Hess, Houtzdale, Pa.,		7.59		3.07	Corn and oats.
†103	Geo. Hilwig & Sons, Priceburg, Pa.,		9.81		5.22	Corn and oats.
130	Ikeler & Fleckenstine, Bloomsburg, Pa.,		10.78		3.38	Corn, wheat products and a little oats.

TABLE X—Continued.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
215	Frederick James, Lanesboro, Pa.,	Horse Feed,	Lancaster,	Frederick James.
131	Kelchner & Frederici, Light Street, Pa.,	Chop,	Bloomsburg,	F. P. Pursel.
75	Keystone Mill, Nanticoke, Pa.,	Mixed Chop,	Nanticoke,	Keystone Mill.
76	Keystone Mill, Nanticoke, Pa.,	No. 1 Mixed Chop,	Nanticoke,	Keystone Mill.
91	Kizer Mill & Elevator Co., Blackrock, N. Y.,	Feed,	Scranton,	F. P. Freas.
222	G. M. Kline, Skinner's Eddy, Pa.,	Mixed Feed,	Skinners Eddy,	G. M. Kline.
89	Lackawanna Mill & Elevator Co., Scranton, Pa.,	Mixed Chop,	Scranton,	M. R. Lewis & Co.
82	*Philip Lewis, Wilkes-Barre, Pa.,	No. 1 Mixed Chop,	Ashley,	John Lipoosky.
72	Luzerne Milling Co., Luzerne, Pa.,	No. 1 Chop,	Luzerne,	Luzerne Milling Co.
73	Luzerne Milling Co., Luzerne, Pa.,	Common Chop,	Luzerne,	Luzerne Milling Co.
87	C. P. Matthews & Sons, Scranton, Pa.,	Mixed Chop,	Scranton,	Easterle & Co.
88	C. P. Matthews & Sons, Scranton, Pa.,	No. 2 Mixed Chop,	Scranton,	C. P. Matthews.
47	Mauser Mill Co., Treichlers, Pa.,	Mixed Chop,	Mauch Chunk,	C. A. Rex.
136	F. & I. Mentzer, Frankstown, Pa.,	Mixed Chop,	Frankstown,	F. & I. Mentzer.
133	T. M. Mensch, Catawissa, Pa.,	Mixed Chop,	Catawissa,	T. M. Mensch.
50	Millard & Scureman, Kingston, Pa.,	Mixed Chop,	Kingston,	Millard & Scureman.
146	Chas. O. Miller, Tyrone, Pa.,	Mixed Chop,	Birmingham,	Chas. O. Miller.
147	Chas. O. Miller, Tyrone, Pa.,	Horse Chop,	Birmingham,	Chas. O. Miller.
64	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	No. 2 Mixed Chop,	Wilkes-Barre,	Miner-Hillard Milling Co.
60	M. W. Morris, Wilkes-Barre, Pa.,	No. 1 Chop,	Wilkes-Barre,	M. W. Morris.
59	M. W. Morris, Wilkes-Barre, Pa.,	No. 2 Chop,	Wilkes-Barre,	M. W. Morris.
101	J. T. Nyhart, Peckville, Pa.,	Feed,	Peckville,	J. T. Nyhart.
102	J. T. Nyhart, Peckville, Pa.,	Special Feed,	Peckville,	J. T. Nyhart.
219	D. V. Personius, Waverly, N. Y.,	Mixed Chop,	Athens,	Samuel Raub & Son.
175	F. V. Perry, Coalport, Pa.,	Standard Mixed Chop,	Coalport,	John D. Fice.
163	Philipsburg Milling Co., Philipsburg, Pa.,	Mixed Chop,	Philipsburg,	F. V. Perry.
201	Pittston Milling Co., Pittston, Pa.,	Chop,	Pittston,	Benedict & Barber.
98	Providence Mill Co., Scranton, Pa.,	Feed,	Scranton,	Providence Milling Co.
126	M. G. Rankin & Co., Milwaukee, Wis.,	Molasses Grains,	York,	H. S. Myers.
71	Samuel Raub & Son, Luzerne, Pa.,	No. 1 Chop,	Luzerne,	Samuel Raub & Son.

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*Agent, shipper or jobber.

TABLE X—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
†215	Frederick James, Lanesboro, Pa.,	....	9.38	....	3.81	Corn and oats.
131	Kelchner & Frederici, Light Street, Pa.,	....	9.78	....	3.97	Corn and oats.
75	Keystone Mill, Nanticoke, Pa.,	24.00	8.81	....	5.53	Corn and oats.
†76	Keystone Mill, Nanticoke, Pa.,	....	8.87	....	2.56	Corn with wheat, rye and oat products.
91	Kizer Mill & Elevator Co., Blackrock, N. Y.,	....	9.11	....	3.74	Corn, oats and wheat products.
†222	G. M. Kline, Skinner's Eddy, Pa.,	....	7.72	....	4.21	Corn and oats.
†89	Lackawanna Mill & Elevator Co., Scranton, Pa.,	....	10.87	....	2.42	Corn, oats and wheat products.
82	Philip Lewis, Wilkes-Barre, Pa.,	....	9.56	....	4.50	Corn with a little wheat and oats.
†72	Luzerne Milling Co., Luzerne, Pa.,	....	11.19	....	3.20	Corn, wheat, buckwheat and oat feed.
†73	Luzerne Milling Co., Luzerne, Pa.,	....	8.94	....	1.65	Corn with some oat feed and buckwheat products.
†87	C. P. Matthews & Sons; Scranton, Pa.,	....	8.81	....	3.61	Corn and oats.
88	C. P. Matthews & Sons, Scranton, Pa.,	....	10.06	....	4.18	Corn, oats and wheat products.
†47	Mauser Mill Co., Treichlers, Pa.,	....	10.95	....	3.53	Corn, oats and wheat products.
136	F. & I. Mentzer, Frankstown, Pa.,	....	8.31	....	3.85	Corn and oat product, some cob.
133	T. M. Mensch, Catawissa, Pa.,	....	10.28	....	2.46	Wheat and rye product, corn and oats.
50	Millard & Scureman, Kingston, Pa.,	10.30	10.56	5.77	4.74	Corn, wheat and oat products.
†146	Chas. O. Miller, Tyrone, Pa.,	....	10.09	....	3.23	Corn and oats with some cob.
†147	Chas. O. Miller, Tyrone, Pa.,	....	10.00	....	3.06	Corn and wheat products.
†64	Miner-Hillard Milling Co., Wilkes-Barre, Pa.,	9.79	8.44	6.70	2.35	Corn with some oat product.
†60	M. W. Morris, Wilkes-Barre, Pa.,	....	9.40	....	2.86	Corn with some oat product.
†59	M. W. Morris, Wilkes-Barre, Pa.,	....	9.40	....	3.09	Corn with some oat product.
101	J. T. Nyhart, Peckville, Pa.,	....	9.51	....	6.02	Corn and oats.
†102	J. T. Nyhart, Peckville, Pa.,	....	9.25	....	5.84	Corn and oats.
219	D. V. Personius, Waverly, N. Y.,	....	8.25	....	5.03	Corn and oats.
175	F. V. Perry Coalport, Pa.,	....	8.66	....	3.71	Corn and oats.
163	Philipsburg Milling Co., Philipsburg, Pa.,	....	7.50	....	5.82	Corn product and oats.
201	Pittston Milling Co., Pittston, Pa.,	....	8.44	....	3.17	Corn and oats.
98	Providence Milling Co., Scranton, Pa.,	....	9.37	....	6.07	Corn and oats.
†126	M. G. Rankin & Co., Milwaukee, Wis.,	25.00	22.06	7.50	3.43	Distiller's grains with molasses.
†71	Samuel Raub & Son, Luzerne, Pa.,	....	10.50	....	2.46	Corn and oats and wheat.

TABLE X—Continued.

Sample number.	Manufacturer.	Brand Name.	Place of Selection.	Name of Dealer.
164	Harry Reidy, Wallaceton, Pa.,	Mixed Chop,	Wallaceton,	Harry Reidy.
48	Robbins Milling Co., Wilkes-Barre, Pa.,	No. 1 Mixed Chop,	Wilkes-Barre.	Robbins Milling Co.
49	Robbins Milling Co., Wilkes-Barre, Pa.,	No. 2 Mixed Chop,	Wilkes-Barre.	Robbins Milling Co.
90	Robbins & Spencer, Scranton, Pa.,	Mixed Chop,	Scranton,	Robbins & Spencer.
100	Max Roth, Scranton, Pa.,	Mixed Chop,	Scranton,	Max Roth.
52	H. N. Schooley & Son, Luzerne, Pa.,	Mixed Chop,	Wilkes-Barre,	John Ahlbrandt.
86	Seybolt Milling Co., Scranton, Pa.,	Mixed Chop,	Scranton,	Seybolt Milling Co.
212	S. C. Sliter, Uniondale, Pa.,	No. 2 Chop,	Uniondale.	S. C. Sliter.
220	Smith & Waldo, Wysox, Pa.,	No. 1 Chop.	Wysox,	Smith & Waldo.
141	Spanogle & Yeager, Lewistown, Pa.,	Horse Chop,	Altoona,	Spanogle & Yeager.
142	Spanogle & Yeager, Lewistown, Pa.,	Mixed Chop,	Altoona,	Spanogle & Yeager.
111	Strayer Bros., York, Pa.,	Mixed Chop,	York,	Martin Bender Co.
181	Toledo Grain & Milling Co., Toledo, O.,	Fresh Ground Chop,	Millwood,	Sylvester Crumon.
148	Tyrone Milling Co., Tyrone, Pa.,	Horse Chop.	Tyrone,	Tyrone Milling Co.
31	Vernon & Yeager, Port Royal, Pa.,	Mixed Chop,	Port Royal,	J. O. Parson.
149	C. Y. Wagner. Bellefonte, Pa.,	Standard Chop,	Snowshoe,	J. A. Kelly & Co.
192	S. B. Wagener & Co., Pottstown, Pa.,	Mixed Chop,	Pottstown,	S. B. Wagener & Co.
158	Warrick Bros., Houtzdale. Pa.,	Mixed Chop,	Houtzdale,	Warrick Bros.
221	Welles Mill Co., Wyalusing, Pa.,	Mixed Chop,	Wyalusing,	Welles Mill Co.
134	White Milling Co., Bloomsburg, Pa.,	Mixed Chop,	Bloomsburg.	White Milling Co.
55	Wilkes-Barre Milling Co., Wilkes-Barre, Pa.,	Mixed Chop,	Wilkes-Barre,	Mandeville & Son.
56	Wilkes-Barre Milling Co., Wilkes-Barre, Pa.,	Nc. 1 Mixed Chop,	Wilkes-Barre.	Wilkes-Barre Milling Co.
57	Wilkes-Barre Milling Co., Wilkes-Barre, Pa.,	No. 2 Mixed Chop,	Wilkes-Barre,	Wilkes-Barre Milling Co.
151	J. M. Williams, Port Matilda, Pa.,	Mixed Chop,	Port Matilda,	J. M. Williams.
161	Wm. Wolf, Philipsburg. Pa.,	Mixed Chop,	Philipsburg,	Wm. Wolf.
159	Isaac Woomer, Graysville. Pa.,	Mixed Chop,	Houtzdale,	G. W. Dickey.

TABLE X—Continued.

Sample number.	Manufacturer.	Composition (Per cent.)				Remarks.
		Protein.		Fat.		
		Guaranteed.	Found.	Guaranteed.	Found.	
		Per cent.	Per cent.	Per cent.	Per cent.	
164	Harry Reidy, Wallaceton, Pa.,	....	11.25	....	4.53	Corn with cob and wheat product.
†48	Robbins Milling Co., Wilkes-Barre, Pa.,	....	8.93	....	3.14	Corn and wheat products.
†49	Robbins Milling Co., Wilkes-Barre, Pa.,	8.61	9.06	4.91	3.44	Corn and oat products.
90	Robbins & Spencer, Scranton, Pa.,	....	10.72	....	5.14	Corn, with a little wheat and oat products.
100	Max Roth, Scranton, Pa.,	....	11.72	....	3.90	Corn, wheat, rye and oat products.
†52	H. N. Schooley & Son, Luzerne, Pa.,	....	8.94	....	1.80	Corn with a little oat feed.
†86	Seyboldt Milling Co., Scranton, Pa.,	....	9.31	....	2.33	Corn with a little oat feed.
212	S. C. Sliter, Uniondale, Pa.,	....	7.87	....	2.38	Corn with oat feed.
220	Smith & Waldo, Wysox, Pa.,	....	8.87	....	3.99	Corn and oats.
141	Spanogle & Yeager, Lewistown, Pa.,	....	8.56	....	5.95	Corn, wheat product, oats and buckwheat.
142	Spanogle & Yeager, Lewistown, Pa.,	....	11.34	....	3.77	Corn and oats with a little wheat.
111	Strayer Bros., York, Pa.,	....	9.81	....	2.53	Wheat, rye, corn and oats.
181	Toledo Grain & Milling Co., Toledo, O.,	....	11.00	....	4.13	Corn, wheat and oat products.
148	Tyrone Milling Co., Tyrone, Pa.,	....	10.66	....	3.13	Corn, oats and wheat and rye products.
†31	Vernon & Yeager, Port Royal, Pa.,	....	12.75	....	1.86	Wheat feed with some corn and oats.
†149	C. Y. Wagner, Bellefonte, Pa.,	11.00	8.44	3.00	3.32	Corn with cob, oats and wheat products.
192	S. B. Wagener Co., Pottstown, Pa.,	....	10.66	....	3.60	Corn, wheat and oat products.
158	Warrick Bros., Houtzdale, Pa.,	....	7.59	....	3.10	Corn with cob and a little oats.
†221	Welles Mill Co., Wyalusing, Pa.,	....	10.31	....	3.33	Corn, wheat and oat products.
134	White Milling Co., Bloomsburg, Pa.,	....	9.78	....	3.43	Corn, wheat, buckwheat and oat products.
†55	Wilkes-Barre Milling Co., Wilkes-Barre, Pa.,	....	9.13	....	2.70	Corn and oat products.
56	Wilkes-Barre Milling Co., Wilkes-Barre, Pa.,	10.01	8.31	8.01	3.87	Corn and oats.
57	Wilkes-Barre Milling Co., Wilkes-Barre, Pa.,	10.01	9.50	8.01	5.27	Corn and oats.
†151	J. M. Williams, Port Matilda, Pa.,	....	11.16	....	5.35	Corn, oats and wheat product, some cob.
161	Wm. Wolf, Philipsburg, Pa.,	....	9.38	....	5.46	Corn and wheat product, some cob.
159	Isaac Woomer, Graysville, Pa.,	....	12.69	....	3.85	Corn, oats and barley.

DISCUSSION OF RESULTS.

Cotton-seed meals and feeds.—With a single exception, the cotton-seed meals came up fairly well to the guaranties given. That of the cotton-seed feed fell very far below guaranty. It is probably difficult to secure a constant mixture of the cotton-seed hulls with the small quantity of meal which is added in making cotton-seed feed.

Linseed meals.—Except No. 42, all are old process meals, judged from their fat content. There is a general tendency to a slight deficiency of protein and excess of fat.

Buckwheat middlings.—Sample No. 228 is of nearly average composition for pure buckwheat middlings.

Wheat products.—The brans are all of fair composition. Of the middlings, the same is true in general; sample No. 80 contains considerable weed seed, conspicuously the false buckwheat. Sample No. 63, sold as "Colonial Middlings," is not a simple wheat product, a considerable amount of a corn by-product being found in it.

Rye products.—No. 206, sold as "Rye Gluten Meal," is not a simple rye product, but evidently a residue from a fermentation industry, probably distillers' grains; considerable quantities of barley hulls are present, doubtless in the form of spent malt; the excess of fat and deficiency of protein found as compared with the quantity, indicates considerable variability in this feed-stuff. The rye feed and chops fall well within the limits of normal variation, though a small quantity of a corn product appeared in No. 46.

Barley products.—No. 1 was an exceptionally rich, pure sample of malt sprouts. The other products show a normal composition, although No. 242 falls below guaranty.

Oat products.—There is no milling product of general manufacture derived from oats to correspond to the feeds produced from wheat and rye, these feeds being mixtures of the bran and middlings with more or less of the true flour. The term "oat feed" is generally used to designate the mixture of oat hull and oat dust left as a by-product in the manufacture of oat meal preparations, while "oat chop" refers to the product obtained by chopping the whole grain. The composition of whole oats shows the following range: Protein, 8 to 14.4 per cent., average, 11.8 per cent.; fat, 3.4 to 5.8 per cent., average, 5.0 per cent. The hull shows a range of 1.05 to 5.08 per cent. of protein, and an average content of 2.48 per cent. of protein and 0.80 per cent. of fat. In the light of these facts, it is clear that all but one of the "oat feeds" analyzed contains a much larger proportion of hulls than whole oats—which, indeed, is the necessary result of the manufacturing operations from which they are derived. With the single exception of No. 195, they contain, on the other hand, very considerable amounts of the oat kernel. The impurities present are in no instance important in amount.

Corn products.—The corn chops exhibit very marked deficiency in fat and rather low protein. Most of the samples collected in the early part of 1903 show a high moisture content, and it is very possible that heating of these moist chops and meals has occurred with a resultant destruction of some of the fat. The samples were analyzed promptly after being received; later check analyses of the samples in question show a marked decrease in this constituent as compared with the percentages first obtained. The microscopic examination reveals no foreign substances whose presence might cause the observed abnormal composition. No. 66, "roller meal," is evidently not a simple corn meal, judging by the fat guaranty; the quantity of fat found is, however, not greater than that used in the corn chops.

The corn brans are of normal composition except the fat in No. 190, which is quite low. This sample contained considerable of the starchy part of the corn kernel.

The gluten feeds exhibit abnormalities. No. 202 has a great deficiency in protein. It contains a large proportion of the starchy material of the grain. No. 118 is very deficient in fat. No. 234 resembles gluten meal rather than gluten feed.

The hominy products, maizeline and flakaline are evidently closely related substances derived from the fatty parts of the kernel. They do not fully conform to the guaranties given.

Mixed Feeds from Named Grains.

Corn and oats.—The probable composition of mixtures of these chopped grains is apparent from the fact that the two grains before mixing show the following range and average of percentage composition in point of protein and fat:

	Corn (Dent).		Oats.		Equal parts of oats and corn mixed.	
	Range.	Average.	Range.	Average.	Range.	Average.
Protein,	7.5-12.8	10.3	8.0-14.4	11.8	7.75-13.6	11.0
Fat,	3.1- 7.5	5.0	3.4- 5.8	5.0	3.25- 6.65	5.0

The figures for protein found in the feeding stuffs examined, show several instances in which this constituent falls as low as the least amount given for corn. There are many instances in which the proportion of oat hull appears to be in excess, but these instances are not individually stated because the available proof is not entirely satisfactory on the basis of the limited chemical examination made. There are many cases of low fat with reference to which the analytical results here reported have been carefully verified. This is undoubtedly attributable to the use, in certain cases, of oat feed,—i. e., the waste from oat-meal mills—instead of whole oats; in other cases, it accompanies a high moisture and may be explained by such decomposition as was noted in similarly moist corn chop. Many samples contained wheat products; the presence of an occasional grain of this cereal would naturally be expected from a consideration of the conditions of production and storage of the corn and oats. No note has, however, been made of the presence of wheat when it appeared only in very small quantity; where "considerable" or "much" is reported, this explanation of its presence is improbable. Where wheat products appear, in these mixed feeds, wheat bran is rarely observed, the addition being made probably in the form of middlings, the high nitrogen content of which is well fitted to cover a depression of protein due to the use of oat feed instead of oats. Another substitution also appeared in quite numerous instances, that of a corn by-product in place of part or all of the chop made from entire corn; the presence of such material is revealed under the microscope by the existence of corn starch grains in the swollen and distorted forms produced by the action of heat upon the moist grain, such corn starch as appears in gluten feeds and hominy products. These corn by-products may also serve to mask the substitution of oat feed for oats. It is clear, therefore, that the practice is very general of selling under the brand, "corn and oats" instead of the simple chop from the mixed whole grains, a mixture of various by-products with one or both of the grains named. This must tend, in the end, to a deception of the consumer. (See 42a.) Where guaranties were given for these mixtures they were quite satisfactorily verified by the amounts of protein and fat found. It is fair to add that the makers of No. 109 declare that nothing but pure corn and oats is used in its manufacture.

Corn, oats and barley.—The range of composition of barley and of mixtures of equal parts of these grains is as follows:

	Barley.		Corn, oats and barley.	
	Range per cent.	Average per cent.	Range per cent.	Average per cent.
Protein,	8.75-14.88	11.33	8.08-14.03	11.14
Fat,	2.06- 3.54	2.68	2,85- 5.61	4.23

The guaranty for the brand represented by Nos. 79 and 127 calls for amounts of protein and fat above the average for a mixture containing much corn or barley. In each of these samples, some corn by-product was found. The average composition of the 48 samples analyzed, reflects this condition, the protein being 9.6 instead of about 11 per cent., and the fat 3.5 per cent. instead of 5 per cent. This average is about the same as that observed in commercial cattle-food investigations in other states.

Rye and oats.—The composition of rye and of a mixture of equal parts of rye and oats is as follows:

	Rye.		Rye and oats.	
	Range per cent.	Average per cent.	Range per cent.	Average per cent.
Protein,	8.75-15.58	11.32	8.37-14.99	11.56
Fat,	1.38- 2.91	1.94	2.39- 4.36	3.47

The presence of wheat starch was noted in three cases out of four. The distinction from rye starch rests upon the swelling and breaking up of the rye starch when heated in water to 62.5 degrees C., when wheat starch remains undisturbed and entire. Careful experiment with known rye products have, in each instance, shown the almost complete destruction of the starch grains. In these samples, most carefully submitted to the same test, a large proportion of those starch grains whose form and size declared them to be either wheat or rye, remained entire and undistorted. It is, however, but fair to state that the manufacturers of No. 173 claim that they introduced no wheat in making this brand. Such substitution promises no large, direct profit.

Corn, rye and oats.—A mixture of equal parts of the three grains might exhibit the following range of composition, though the occurrence of the extremes is not probable in the case of pure grains:

	Range per cent.	Average per cent.
Protein,	8.68-14.26	11.14
Fat,	2.63- 5.40	3.98

The table requires no comment.

Mixed Feeds from Materials not Named in the Brands: I. *Proprietary Brands.* (*a*) *Non-condimental.*—Several of these warrant special mention. No. 7, "Fourex Grains," is prepared by kiln-drying the spent grains left in the distillery mash-tub. The protein, fat and fiber of the cereals are chiefly retained in the grains and they do not appear to suffer marked change in their original nutritive proportion by reason of the manufacturing processes through which they have passed; most of the starch, on the other hand, and part of the soluble ash constituents, notably the potassium phosphate, are removed in the mashing process. "Ajax Flakes," No. 9, is a similar preparation.

No. 123, H. O. Horse Feed, is commonly observed to contain a little linseed meal. It has not, however, been found in this sample.

Nos. 199, "Blue Grass Mixed Feed," and 210, "Jersey Mixed Feed," are wheat feeds to which very considerable quantities of granulated corn cob have been added. It is difficult to see what advantage such a mixture offers in comparison with ordinary wheat feed. Both brands are manufactured at Henderson, Ky.

Nos. 20 and 106 fall considerably below guaranty.

(b) *Condimental Brands.*—The composition of the two condimental foods examined is stated in the table. No. 198 is claimed to contain enough gentian, fenugreek and anise seed to secure their tonic properties; the microscope does not show their presence in large quantity.

Concerning such feeds, it may be repeated: The fact that a little tonic bitter substance or salt is mixed with ordinary feeding stuffs, does not secure for the food thus flavored any general medicinal value nor for the contained feeding stuffs any higher nutritive value, than they normally possess. Very careful experiment has failed to show any gain in tissue-producing power on the part of any cattle-food because of the use of condimental substances in the ration containing it. The feeds whose analyses are here given, are both quite rich in protein and fat, though less rich than flaxseed or linseed meal alone would be. The carob bean is a sweet, well flavored substance and is probably fairly digestible. When tonic treatment is required, it can be given more cheaply and certainly by direct use of simple tonic substances in known quantity. These remarks are not intended to discourage the use of special mixtures for special purposes, such as calf-feeding, but to emphasize the fact that the addition of a little very mild medicine will not enable a healthy animal to extract more nutriment from a feeding-stuff during the digestive process, nor to make a pound of digested carbohydrates, protein or fat go any further in making meat or milk or eggs.

II. *Brands not proprietary.*—The ingredients of these foods are stated in the table. The use of manufacturing by-products instead of the chopped product from the entire grain, is very common in these feeds. Taken as a whole, their general tendency is to be low in both protein and fat; as earlier shown, mixtures of entire grains show, on the average, from 11 to 12 per cent, of protein and from 3.5 to 5 per cent. of fat; the average of the 91 analyses here presented is, protein, 9.92 per cent. and fat, 3.76 per cent. So far as these feeds were guaranteed as to composition, they conform fairly well to the claims set forth in the guaranty, with a few marked exceptions: Nos. 78, 140, 64, 126, 49, 56 and 57 fall distinctly short in the fat guaranteed; in all these cases except 140, 56 and 57, the samples when received contained high percentages of hygroscopic moisture, whereby the corn oil may have suffered decrease similar to that observed in plain corn chops. Nos. 75, 126, 64, 149 and 56 fall somewhat short of the protein guaranteed. In the case of No. 75, the guaranty is unusual in form and is probably based upon an erroneous understanding of the legal requirements.

Briefly reviewed, the year's examination has not shown new types of adulteration; but the practice of adding foreign products to feeds sold as mixtures of named grains and of selling without guaranty feeds made in whole or in part from by-products still appears very general.

Respecting the use of commercial feeds, a final word may not be out of place. For horses and cattle not upon the farm, a great variety of feeds may be used. The farmer, on the other hand, is usually able to grow his fibrous and starchy foods more cheaply than he can purchase them. His need is rather an increased supply of protein with which to supplement and balance up his foods of home production. For this purpose, the food purchased must be richer, much richer usually, than corn, which has an average content of 10.3 per cent. of protein and 5 per cent. of fat.

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